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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/421,217 10/20/99 TAKAHASHI

H 0057-2533-2Y

MM91/1010
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EXAMINER

LOKE, S

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

10/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.		Applicant(s)	
	09/421,217		TAKAHASHI, HIDEKI	
	Examiner		Art Unit	
	Steven Loke		2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-39 is/are pending in the application.
- 4a) Of the above claim(s) 27-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s) _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 22, 24 and 26 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hagino.

In regards to claim 22, Hagino shows all the elements of the claimed invention in fig. 3. It is an insulated gate semiconductor device, comprises: a first semiconductor layer [1] of a first conductivity type (p) having first and second main surfaces on opposite sides thereof; a second semiconductor layer [3] of a second conductivity type (n) provided on the first main surface of the first semiconductor layer; a third semiconductor layer [5b] of the second conductivity type higher in an impurity concentration (n+) and thinner than the second semiconductor layer [3], and provided on a surface of the second semiconductor layer [3]; a fourth semiconductor layer [4a] of the first conductivity type provided on a surface of the third semiconductor layer [5b], wherein the third semiconductor [5b] is interposed between the second semiconductor layer [3] and a bottom of the fourth semiconductor layer [4a]; a fifth semiconductor layer [5a] of the second conductivity type selectively provided in a surface of the fourth semiconductor layer [4a] and opposing the third semiconductor layer [5b] through the fourth semiconductor layer [4a]; a first main electrode [9a] disposed across and connected with surfaces of the fourth and fifth semiconductor layers [4a, 5a]; a second main electrode [10] provided on the second main surface of the first semiconductor

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layer [1]; an insulating film [7a] provided on a portion of the fourth semiconductor layer [4a] interposed between the third and fifth semiconductor layers [5b, 5a]; a control electrode [8a] facing the portion through the insulating film [7a] so that the portion forms a channel region [6a].

In regards to claim 24, Hagino discloses a sixth semiconductor layer [2] of the second conductivity type higher in an impurity concentration (n+) than the second semiconductor layer [3] provided between the first and second semiconductor layers [1, 3].

In regards to claim 26, Hagino discloses the first main electrode [9a] is not contacting any other semiconductor layer than the fourth and fifth semiconductor layers [4a, 5a].

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hagino in view of Clark et al.

Hagino differs from the claimed invention by not showing the second semiconductor layer extends through the first semiconductor layer and is partially exposed in the second main surface of the first semiconductor layer.

Clark et al. shows an anode structure comprises a second semiconductor layer [11, 13] extends through the first semiconductor layer [12] and is partially exposed in the second main surface of the first semiconductor layer [12] in fig. 1.

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Since both Hagino and Clark et al. teach a drift region in an insulated gate bipolar transistor, it would have been obvious to have the anode structure of Clark et al. in Hagino because it reduces the on-resistance of the device.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hagino.

It would have been obvious for the sixth semiconductor layer extends through the first semiconductor layer and is partially exposed in the second main surface of the first semiconductor layer because it depends on the switching speed of the device.

Applicant's arguments with respect to claims 22-26 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Loke whose telephone number is (703) 308-4920. The examiner can normally be reached on 7:45 am to 5:15 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

sl
October 4, 2001

Steven Loke
Primary Examiner

